

CLAIMS

1. A field effect transistor comprising:
a semiconductor layer, a source electrode and a drain electrode
5 electrically connected to the semiconductor layer, a gate electrode for
applying an electric field to the semiconductor layer,
the semiconductor layer comprising an organic semiconductor
material and a plurality of thin wires made of an inorganic semiconductor.
- 10 2. The field-effect transistor according to claim 1, wherein the thin wires
are connected to at least one electrode selected from the group consisting of
the source electrode and the drain electrode via the organic semiconductor
material.
- 15 3. The field-effect transistor according to claim 1, wherein both the
organic semiconductor material and the thin wires function as a p-type
semiconductor.
4. The field-effect transistor according to claim 1, wherein the
20 semiconductor layer is formed in stripes parallel to a direction connecting the
source electrode and the drain electrode.
5. The field-effect transistor according to claim 1, wherein an average
diameter of the thin wires is 100 nm or less.
- 25 6. The field-effect transistor according to claim 1, wherein the thin wires
are oriented in a direction connecting the source electrode and the drain
electrode.
- 30 7. The field-effect transistor according to claim 1, wherein the thin wires
are grown from at least one electrode selected from the group consisting of
the source electrode and the drain electrode.
8. An electronic device comprising a substrate and a transistor formed
35 on the substrate, wherein
the transistor is a field-effect transistor according to claim 1.

9. The electronic device according to claim 8, wherein the substrate is made of a polymer material.

10. The electronic device according to claim 8, wherein the device is an active matrix-type display.

11. The electronic device according to claim 8, wherein the device is a wireless ID tag.

12. The electronic device according to claim 8, wherein the device is a portable device.

13. A method of manufacturing a field-effect transistor comprising a substrate, a semiconductor layer formed on the substrate, a source electrode and a drain electrode electrically connected to the semiconductor layer, the method comprising the steps of:

(i) growing on the substrate a plurality of thin wires made of an inorganic semiconductor;

(ii) laying down the thin wires in a direction connecting the source electrode and the drain electrode; and

(iii) impregnating space between the laid-down thin wires with an organic semiconductor material.